History of Electronic Grant Applications

Date	Event	Benefits	How it fits with plan to go electronic
1970s	With advent of computers, NIH Institutes and Centers (ICs) started to see advantages of using computers to process and store application information.	▪ Less paper. ▪ Less storage space. ▪ Faster processing.	Investment in computers and IT staff.
	IMPAC I, a mainframe system, initiated to provide enterprise-wide database of grant information.	▪ Database available for grant information.	Established concept of an enterprise-wide information computer system.
	Applications sent to NIH on paper. CSR made paper copies for distribution. Information from paper copies manually entered into local systems.	▪ Electronic information available from paper applications.	Expertise continues.
1980s–90s	IMPAC I continued to be developed with central database. Applications on paper. Functional area modules started to be developed.	▪ Automation of more grant administration functions.	
Late 1990s–early 2000	IMPAC II, based on client-server technology, expands development of functional-area modules, e.g., Receipt and Referral, Review. Commons was developed as an interface for grantee community. However, it was a pilot but was never released to full production.	▪ Improved technology. ▪ Database information expanded.	Internal electronic modules, based on early technology, develop. Provides basis for wider range of electronic functional modules with possibility of an end-to-end electronic system.
2000	Various organizational components at NIH began scanning millions of pieces of paper associated with the grant application and funding process. This was not an organized effort. CRISP was first to populate its records by scanning integral parts of grant applications into	Benefits of scanning: ▪ Instant availability of the application to multiple users. ▪ Reduction in paper volume. ▪ Cost savings. ▪ Fostering of collabo-	Scanning afforded very realistic prototypes for e-grants. Learning by doing enabled NIH to prepare for complex changes in technology, processes and organization well before receiving its first live e-application.

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	digital format. National Cancer Institute scanned two years (more than three and a half million pages) of funded grant applications into digital format and populated a searchable Web-enabled database.	rative work.	
June 2000	Center for Scientific Review began scanning the second page (application abstract) of each application. The scanned images were placed in an internal database accessible by CSR staff only.	▪ Saved re-keying more than 10,000 pieces of paper to date.	
Jan 2001	eRA started a redesign and reengineering of the NIH eRA Commons, which previously had been a pilot but never released.		Necessary to set the stage for grant applicants to have Web access to NIH data.
2001	Began enterprise-wide scanning effort.		First step toward eliminating/reducing paper after initial application receipt. Started changing processes to accommodate on-line applications.
Spring 2001	Implemented the Electronic Grant Folder, a collection of grant-related documents and reports available online. Its initial implementation included PI grant history (brief live report); PI grant history (detailed live report); current summary statement; prior summary statements; abstract and notice(s) of grant award.	▪ An important step toward eliminating 200 million pieces of paper annually generated in the NIH internal process of copying, collating, filing, distributing and maintaining paper records. ▪ Better quality control and policy compliance- minimize human manipulations for collating, filing or misfiling records. ▪ Instant access by all	Progress toward acceptance of electronic records as the official records.

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		at NIH. ▪ All applications indexed and text searchable. ▪ Savings to NIH estimated at $34 million dollars per year. ▪ Helped to prepare NIH for e-grants. ▪ Established a common process to share information with the investigator and the administrative offices at the institution.	
Summer 2001	Pilot scanning project; scanned 500 grant applications.	▪ Established proof of concept.	Pilots helped to determine how scanned or electronic grant applications might be used, what gaps existed in IMPAC modules; what changes needed to be made to policy and business practices to better use the digital grant.
June 2001	Started to transition to IMPAC II. Changed computer platform from mainframe to client-server.	▪ Client-server technology provides a more flexible, robust system.	Provided upgraded computer base with which to develop electronic modules and processes.
Jan 2002	CSR began scanning all incoming grant applications. Competitive applications available in the IMPAC II Grant Folder about 72 hours following receipt. Scanned documents also put on CD-ROMs for distribution. Between January 1 and June 19, 2002, 21,797 new grant applications were scanned, representing approximately 99.8 percent of all incoming grant applications.	▪ Reduced costs for reproduction, labor, mailing and storage space. ▪ Applications sent on CDs. ▪ Provided relief from volume of paper. NIH received 51,000 applications and managed a collective portfolio of 80,000 active grants in 2001. Scanning freed space in IC file rooms and	Conversion of paper documents to electronic images was an interim step in eRA's federally mandated goal of accepting electronic grant applications by FY 2003. Scanning enabled ICs to normalize procedures for grant processing instead of maintaining separate procedures for digital and paper.

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	Between January 1 and June 19, 2002, 6,121 individual CDs were ordered, allowing approximately 245 study section meetings to provide their reviewers with CDs.	in the offices of Program staff. ▪ Scanning allowed faster retrieval and concurrent access by multiple users.	
Feb 2002	Applications on CD for Reviewers.	▪ Eliminated paper copies to Reviewers and associated mailing costs.	
Oct 2002	IMPAC I retired.	▪ Reduced costs of maintaining both production and legacy systems.	
Oct 2002	Six eRA Small Business Innovation Research (SBIR) grants awarded.	▪ Awardees to develop a tool or service to help grantee organizations increase their electronic interaction with the NIH.	Addressed issue of eliminating paper applications by developing products and services for electronic submission of applications.
Nov 2002	A one-stop Internet grant portal for E-Grants project announced at eRA Retreat by Charlie Havekost, Program Manager. E-Grants superseded the Federal Commons. The Federal Commons was an Internet grants management portal for the grantee organization community for online access to information about Federal Grant Programs. All grant-making agencies to use SF424 Research and Related (R&R) form. NIH to supplement SF424 (R&R) with PHS-specific forms.	▪ Government-wide response to Public Law 106–107 and the President's Management Agenda, both of which mandate improving access to federal grants via the Internet. HHS designated the managing partner for this project.	
Nov. 2002	eRA Commons 2, the redesigned version, is released to the Commons Working Group to test. Enrollment begins in the	Provides the entry point for eSNAPs and Financial Status Report (FSR) applications, and other to be release ap-	Provides the foundation for the robust eRA Commons used today.

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	Commons for former Commons 1 and IMPAC I Financial Status Report (FSR) users.	plications.	
Dec 2002	Scanning—Completed first full year of scanning all incoming apps.		
Dec. 2002	Financial Status Report (FSR) Web.	▪ The new system, accessible through the NIH eRA Commons, replaced a dial-up/terminal-based program used by more than 200 grantee organizations.	This application represented another step toward responding to Public Law 106-107 and the President's Management Agenda, both of which mandate improving access to federal grants via the Internet.
January 2003	eRA began federally mandated initiative to develop a system to receive and process electronic Competitive Grants Applications (eCGAP). Built infrastructure to accept PHS398 equivalent forms in an Extensible Markup Language (XML) file created and transmitted by grantee institutions, Service Providers and federal E-Grants electronic application system. Since the SF 424 was not yet developed, the project forged ahead using the 398 form, which provided expertise applicable to accepting the new form. First pilot in fall.	▪ Complete elimination of paper since applications submitted through the Web uses a data stream that populates the eRA database. This data then is pulled into the functional-area modules.	Defined standards and business flow. Investigated issues of receiving, storing, and loading data into eRA databases. Tested receipt and validation functions with external partners. Defined and tested business-to-government exchange. Defined and implemented profile (PPF and IPF) transactions, defined a receipt stream for FSR and eSNAP, and prepared for production release of eCGAP system.
January 2003	eRA Commons released to the public. Registrations encouraged. A Commons helpdesk is put in place to respond to the public.		Registration in the eRA Commons will be necessary for electronic grant submissions.

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January 2003	eSNAP Pilot. eSNAP was the precursor to eCGAP and involved making policy changes, such as dues dates, to accommodate electronic, online data.	▪ Users can submit and access their eSNAP progress reports using the Commons Web interface.	
March 2003	Upgraded server operating systems and application software to the most current levels in preparation for the upgrade to Oracle9*i*Database (Oracle9*i*/DB) and Oracle9*i* Application Server (Oracle 9i/AS).	▪ eRA can develop modules so that users and staff can use NIH eRA electronic systems through Web-based screens.	Sets the platform for electronic submissions using J2EE architecture, which was necessary for developing a true Web-based, electronic receipt system. Oracle 9*i* enabled the integration of more data and offered better tools for data analysis. Oracle 9*i*AS provided a Java 2 Enterprise Edition (J2EE) platform for building and deploying enterprise Java applications accessible from any Web browser or wireless device.
March 2003	Published draft document outlining challenges and proposed solutions to the receipt of applications as XML files with attachments. Designed e-ticket system for use with the NIH eXchange to control the load by queuing submission requests. Proposed a strategy and designed an XML schema to satisfy E-Grants initiative's concepts of "core data (SF424 R&R)" and "non-core" agency-specific elements."		Defined process flow for how an application is packaged by a Service Provider or institution, how the request for submission is transmitted to the NIH, how the application file itself is transferred to NIH, how it is validated and processed, and how the NIH acknowledges receipt of the application. Methodology based on business-to-business (B2B) exchange concept whereby NIH systems and external partners communicate system-to-system according to predefined protocols.
Spring 2003	Centers for Disease Control and Prevention (CDC) started to consolidate the processing of all CDC research grants under FYI.	▪	

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	Health Resources and Services Administration (HRSA) began migration to eRA.		
April 2003	Five agencies had contributed to the Computer Retrieval of Information on Scientific Projects (CRISP): National Institute for Occupational Safety and Health (NIOHS) of the Centers for Disease Control and Prevention (CDC); the Agency for Healthcare Research and Quality (AHRQ); the Health Resources and Services Administration (HRSA); the Substance Abuse and Mental Health Services Administration (SAMHSA); and the Food and Drug Administration (FDA).	▪ Provided one database for information from other Operational Divisions (OPDIVs) of the Department of Health and Human Resources (DHHS).	Some foundations had been laid for accommodating data from other DHHS OPDIVs.
April 2003	Added extra servers and storage capacity to accommodate an increase in electronic grants administration data and a growing number of users of eRA systems. eRA started using J2EE for all new development. eRA began to redesign existing client-server applications in Java.	▪ Applications built with J2EE are faster, more reliable and more accessible from remote locations.	J2EE software development platform ensured that eRA applications take advantage of the most current Internet technologies.
July 2003	First phase of Grants.gov pilot begins	▪ Improved coordination, quality and efficiency of electronic grant administration operations for grantors and grantees.	Tested grantee's ability to download, fill in and submit SF 424 applications electronically. Tested Service Providers ability to create mechanisms for electronic submission of the PHS398 application. eRA worked with Grants.gov to ensure that the new federal grant submission process and NIH eRA CGAP remained completely compatible.

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July 2003	Internet Assisted Review in production.	▪ Reviewers can access applications through the Web, review and score them, and prepare for review meeting.	Module pulls data from scanned documents in the database but also from those submitted electronically. Facilitates preparation of summary statements.
August 2003	The Department of Health and Human Services (DHHS) announced that eRA would be the DHHS enterprise system for research and grants management.	▪ Provides one enterprise-wide system for grants management.	Added another layer of complexity and new ways of accommodating varying requirements had to be developed.
Fall 2003	eRA continued to upgrade internal systems to be able to route electronic applications through the NIH Receipt and Referral process without reverting to paper at any point. Upgraded Status (in eRA Commons) to provide a new inquiry function allowing submitters to track the progress of their electronic applications through the system.	▪ Significantly improved grantee access to status of grant application.	An early step in replacing traditional communications between NIH and its grantees with electronic communications.
Oct 1, 2003	First eCGAP pilot. eRA accepted first electronic Type 1 applications in test and stage systems. Tested paperless processes for receipt and referral.	▪ Paperless submission through receipt and referral in place.	eRA and participating institutions collaborated with Service Providers, who are building tools to assist grantees with the creation and submission of electronic applications.
October 2003	NIH officially accepted electronic documents and data stored in the eRA and Institute databases as legitimate components of the official grant file, in accordance with HHS Grant Policy Directive (GPD) Part 3.06: Post-Award Reports and Records.	▪ Implementation will result in reducing paper and storage requirements and eliminating duplicative effort and administrative burden.	By officially certifying the eRA enterprise system as an electronic repository, NIH established the foundation for moving forward to a less-paper environment.
Spring 2004	eRA Commons and IMPAC II databases merged.	▪ Created common database for internal and external transactions. ▪ Eliminated need to	System in place for electronic data streams from grant applications to be read internally and externally from same database.

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		maintain and synchronize separate databases.	
June–July 2004	Third electronic application pilot (for January 2005 council round). Accepted more complex e-applications (including full-budget).	▪ No exchange of paper.	NIH converted the data into an electronic application image and stored both the image and data in the eRA database. Developing the capability to handle applications responding to Requests for Applications (RFAs) and Program Announcements (PAs) for supported types and mechanisms.
Fall 2004	Worked on outstanding issues: ▪ Electronic Signature. ▪ Service Provider Certification. ▪ Support for Service Providers. ▪ Support for corrections to applications after submission. ▪ Error Handling.		Addressed several issues necessary for the electronic receipt system to work.
October/ November 2004	Conducted fourth and final pilot for modular, non-consortia electronic grant applications for R01, R03 and R21 mechanisms. Received 4 full-budget applications.		More than 30 research institutions participated in pilot testing.
January 2005	Continued to collaborate with Grant.gov in developing infrastructure.		Mapped SF 424 Research and Related (R&R) data elements to the eRA database. Defined business validations for Grants.gov applications. Completed initial eRA/Grants.gov system-to-system testing. Worked on: ▪ Developing the NIH-

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			specific forms and schema to supplement the SF424 (R&R).
			▪ Integrating Grants.gov Web service calls with the eRA eXchange.
			▪ Implementing business validations for Grants.gov applications.
			▪ Creating mechanism to send warnings and error messages to the applicant through the eRA Commons.
			▪ Finalizing and posting the NIH-specific application package on Grants.gov.
			▪ Generating a grant image based on the SF424 (R&R) format.
			▪ Developing the eCGAP Receipt and Referral (R&R) Module for internal use by CSR to process electronic grant applications received through the eRA eXchange.
January 2005	Major milestone: NIH began receiving an unrestricted number of electronic, modular, non-consortia R01, R03 and R21 grant applications (new, competing continuation and revised).	▪ Expansion of the number of electronic applications with the corresponding reduction of the number of paper applications.	Demonstrated eRA's ability to review electronic applications.
Feb/March 2005	Pilot for full-budget applications.		
May 25, 2005	eRA/Grants.gov integration pilot.		eRA mapped SF424 (R&R) data elements to eRA database. eRA submitted PHS-specific data analysis to supplement the SF424 (R&R). eRA (with input from other OPDIVs) defined business

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			validations for Grants.gov applications.
			eRA and Grants.gov completed initial system-to-system testing.
			NIH developing and testing code to accept SF424 (R&R)-based applications and process them electronically.
			Need to do:
			▪ Integrate Grants.gov Web service calls with the eRA eXchange.
			▪ Implement business validations for Grants.gov applications.
			▪ Modify the existing eRA database to accommodate new fields on the SF424 R&R and other differences between 398 and 424 R&R data.
			▪ Create mechanism to send warnings and error messages to the applicant through the Commons.
			▪ Finalize and post an NIH-specific application package on Grants.gov.
			▪ Generate a grant image based on the SF424 (R&R) format.
			▪ Invite Commons Working Group members to participate in tests using previously submitted application data.
June/July 2005	Pilot for accepting supplements and addenda.		